New career advancement patterns in Italian universities: productivity, age and ranks of positions

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Abstract

The new Habilitation, established in Italy in 2010 and launched in 2012, was introduced to filter eligible candidates in the competition for associate and full professorships. Its purpose is to limit agreements between colleagues to make academic appointments on the basis of patronage and instead set minimum conditions based on scholarly output. This study draws on a national dataset in four disciplinary fields – Physics; Engineering; Law; Economics: two being bibliometric and two non-bibliometric. The main hypothesis is that a candidate's current position and seniority (years after last promotion) should play no part in determining the award of the Habilitation. Only indicators of output should be considered by committees. After controlling for such indicators as publications, affiliation with committee members, age, gender, current position and time since last promotion, data show better predictors of attaining the habilitation to be: 1) quality of scientific output (H index and articles in top ranked journals); 2) current ladder rank; 3) younger candidates, especially within the same ranks. As a result, the traditional seniority pattern and the allegedly opaque procedures in recruitment and promotion appear to be yielding place before quicker career paths for the more productive.

Key Words: Habilitation, career ladder, academic output, research evaluation, seniority

1. Introduction: habilitation as a new recruitment and career advancement tool

Recruitment in Italian universities has often been characterized by open door policies and by long periods when national competition for appointment to post was suspended. A comparative survey with French Physicists (Pezzoni *et al.*, 2012) found that imbalances in the demographic profile of Italian academics reduced their scientific output mainly because of the absence of appropriate and regular controls over recruitment and advancement. Arguably, when such restrictions are imposed, some loss of talent may take place. Nevertheless, whilst liberal recruitment practices may make it easier for the individual to embark on an academic career, they are detrimental to scholarly output. The introduction of the new Habilitation is expected to tackle the problems both of insufficient qualification for new staff and of their career advancement. In Italy, *Personal influence*, as Clark noted (1977, 1983) has always played a crucial role along with the formal legal procedures enshrined in *concorsi* (competitions). The latter brought together a mix of Napoleonic formal rules combined with the traditional influence wielded by the Chair (Clark, 1977). Against this backdrop, the Habilitation provides a new instrument for scientific and public recognition precisely because it determines the possible pace of promotion and advancement, which was found to be relevant (Youtie et. al. 2013). Law 240/2010, also known as *Gelmini Law*, cut back the ranks of permanent positions from three – full professors, associate professors, and assistant professors (*ricercatori*) – to two: full and associate professors. Despite the massive literature on early career patterns in sciences and their determining influence upon subsequent life-long careers, such data have a major importance for policy. In the case of senior scholars, they show up both personal strategies and publication range which nevertheless contribute to promotion (Mumford *et al.*, 2005).

The Habilitation is not a new device for academic recruitment. It has been in practice for many years in Germany, where it is comparable to the new fixed-term assistant professorship in Italy: essentially, the German Habilitation is a second PhD and focuses on a topic differing from the original PhD dissertation (Enders, 2001). The German Habilitation is, thus very different from its Italian counterpart. In France, the Habilitation is a qualification awarded by the *Conseil National des Universités* (Musselin, 2004) and is very similar to the Italian case. The Spanish *abilitación*, in its first form, restricted the numbers awarded in keeping with the number of posts available. The *acreditación*, which replaced it, has no cut-off points and in this respect bears greater similarity to the Italian case. Despite their nominal similarity, and their marked differences this aspect will not be developed further.

In Italy, the reform seeks to make candidates eligible for participation in future competitions for full professorship (first level) and associate professorships (second level) without the prior condition of the *idoneità* (eligibility, or fit-for-the-job), a condition previously used to give posts to high scoring but rejected candidates from earlier competitions. Success in this competition does not necessarily guarantee appointment. In one respect, the Habilitation creates a "*tougher pool of candidate and a selective examination*". Compared to competitive examinations, the Habilitation extends recruitment in time by adding one further step, a feature sometimes presented as a "tournament" (Musselin, 2004). Furthermore, it introduces an element of deliberate opting in or opting out. (Musselin 2005b: 50), particularly at the level of associate professor. If those without a tenured post are to survive they must obtain a Habilitation. New fixed-term appointments and/or positions funded externally, held by post-docs and assistant professors, merely underline both the situation and the choice to be made either way.

Despite the avowed purpose of strengthening meritocracy further, this initiative manages even the complex issue of current aging of Italian academic staff whose details are discussed later. To have the best person in an open position can be seen as reflecting the Mertonian assumption about universalism (Long, Fox, 1995; Long 1978). This assumption clashes both with social capital and with the shared concerns of interest communities, though in the case of Italy these tensions tend to be more evident. More recently Su (2014) suggested that some degree of meritocracy, defined as "human capital alone" (that is, skills and abilities acquired by the individual) can coexist with social capital on condition that *ad hoc* policies for women and minorities are put in hand.

This paper analyzes the first round of the Habilitation, which took place in 2012. The article is divided into three parts. The second section provides an overview of the data available. Evidence from other studies is reviewed. Section three describes four logistic regression models for each area analyzed with the purpose of ascertaining whether indicators other than academic productivity and output are associated with the outcome. Included in the data is the Habilitation for full Professorship which provides us with more comprehensive detail about previous ranks held in the course of an individual's career in academia. In the concluding section, some remarks are made about the changes the new Habilitation appears already to have accomplished.

2. Available data and literature

Data about the Habilitation and its procedure, which entails a research evaluation of individuals by committees of 5 senior academics, are transparent and publicly available[1]. The universe, or sub-universe (single disciplines) may be analyzed without the problems, habitually faced by surveys – that of response rate (Bentley, Kyvik, 2013). The list of variables used is as follows: *a)* Dummy of attainment of the title, used as dependent variable; *b)* Three indicators of scientific productivity, similar to other studies (Ginther, Kahn, 2004; Sabharwal, Hu, 2013; Tian 2000; Saatay, Ramanujam 1983); *c)* age; *d)* gender; *e)* status of the candidate (in university or outside university; only insiders enter the analysis as observations). For "insider"candidates (i.e. university staff), further variables are gathered: *e-i)* Position held by the candidate (i.e. full types of research assistants and associates); *e*-ii) Membership of the same Department as one of the member of the Committee ("1" if a candidate comes from one of the four[2] departments as the senior evaluators; "0" if not; variable label "aff").

Three indicators of scientific productivity (*b*) are split between the hard sciences and the soft sciences. The hard sciences include: (α) the Hirsch index normalized by academic age: a natural number comparable within similar disciplines; (β) normalized number[3] of articles; and (γ) normalized number of citations. The soft sciences provide: (α') normalized number of articles published in *top ranked* journals. In this case, an attempt was made to discriminate general productivity – alleged in most of the cases to be of modest value, parochial and poor in originality and innovation (Perotti 2002) – from a selected list of top-ranked reviews per sector, as with other studies (Giles, Garand, 2007; Nightingale, Scott, 2007); (β') stipulated number of books; and (γ') number of chapters in books and articles. Regarding the reliability and validity of the data, the three indicators used in this study were assumed to have an intrinsic validity for research productivity[4], while nothing they can tell about collaboration networks (*social capital*: Pezzoni *et al.* 2012) nor about specialization in topics (Leahey, *et al.* 2010). H indexes and articles in top-ranked journals were assumed to measure a proxy of *quality* of scientific production, while the others can be assumed as productivity indices for quantity of output, with uncertainty about its quality. Differences in bibliometric and non-bibliometric sectors are not investigated further. Nonetheless, bibliometric indicators are more a reflection of the relevance of publications through the citations and the H index, while not-bibliometric items derive their importance through being published in pre-selected journals[5]. It should be noted that some

[1] Row individual data (full publications and CVs all in pdf files) are uploaded by candidates and certified by the Minister. An external observer can see the CVs (with date of birth and the full list of publications), the outcomes with explanations of decisions by all single members of the committees and a personal scheme with the indicators.
[2] Usually Committees are made of 5 member, being one from abroad. Affiliation of the scholars not working in Italy is not taken into account.
[3] Normalizations are basically referred to a measure of personal contribution to an output when the latter are signed by more persons.
[4] Full texts have been uploaded to a national repository by the candidate; the main Italian publishers signed an agreement with the Minister to make available free and certified pdf copies to authors requesting them.
[5] It is to be mentioned that for not-bibliometric disciplined the full list of top-ranked journals was resealed basically in the same time that candidates were applying. This implies that scholars have never selected a journal on the basis of its ranking or status, unless the status and the prestige was totally informal and not recognized by any official document. To this regard, any evidence discussed by McDonamld and Kam (2007) cannot still be observed. The

criticism arose over ~~the~~ alleged misuses of bibliometrics in the social sciences (Rebora, Turri, 2013) which affected a combination of managerial tool and straight peer review practices (Musselin, 2013).

Committees had thus to check the minimal thresholds for each indicator based on the medians of the total population. These values were drawn up by the Minister for the occasion. Indicatively, a person ought to be awarded *habilitated* only if two of the three indicators reached the medians among the sector in question (including those scholars not applying). Since indicators of productivity are considered to be continuous, they are treated as interval variables. Credits assigned by the committees, for instance, competitive projects or grants, led or participated in, did not figure in the analysis. As Youtie *at al*. (2013) noted credits such as these play a marginal role in Europe compared to the US. Though Committees were many (180) and recognized a strong autonomy at micro-discipline level (Becher and Trowler 2001), the topics of publications are not taken into account. This decision can be justified by a US study, which found that cross-community output is not seen as relevant for attaining one's rank (Millar, 2013). Either way, it is assumed that multi-applicants to neighboring disciplines have solved the question of possible interdisciplinary profiles. Data are treated in terms of disciplinary fields – some 14 in all (*aree disciplinari*). Multi-applicants are computed as "winners" if they were awarded the Habilitation in at least one sector. Similarly, affiliations of committee members, were controlled for, on grounds that it could affect outcome (Combes, P. P., Linnemer, L., Visser, M., 2008). Thus, the variables "aff" indicate that 13.7% of all candidates who are university staff shared the same department affiliation as one of the Committee members (for candidates applying in more disciplines, affiliation "1" indicates the same department in at least one scientific sector).

Age, even though a simple variable, deserves some qualifying. Date of birth, and hence age at 2012, does not mean time spent in research: candidates may have finished their studies at different ages. Equally, they may have different career trajectories into and out of universities or other organizations. Despite the association between the H index and age (Mannella, Rossi 2013), or even net years spent in research, this different distribution is one reason to control the first hypothesis with the treatment of age. Age remains a key variable above all in respect of the socialization that scholars live and accumulate across their careers. If, at an early stage, they join a good Department, this will have greater impact than if they do so later. Publication practices and strategies are shaped thereby (Aschhoff, Grimpe 2013).

Drawing on annually updated datasets of Italian employees at all universities when the most recent (or very first) promotion occurred for each individual, could be plotted. This supplies a useful detail in understanding the most recent step of one's career and also whether seniority might have been taken in account even for people with a poor publications' list. Of Italian university staff, 51.9% had their most recent promotion (or entry as employee) in the previous 5 years (from 2007 till 2012); a further 30.8% between 2001 and 2006; 17.3% had been promoted in the year 2000 or before.

Another approach involves gender. Women's careers in higher education have been extensively addressed (Bagilhole, Goode, 2001; Duberleya, Cohen, 2010; van den Brink, Benschop, Jansen, 2010). Gender discrimination was found to relate to social capital (Brooks *et. al.* 2014). Baker (2010) found that women may consider themselves not to meet minimum requirements even prior to compete for career advancement in academia career a self-valuation deriving from early socialization, family responsibilities and gender assigned self-perception. This mechanism seems analogous of that of "cooling out" analyzed by Burton Clark (1960).

In Italy, as was pointed out earlier, the Habilitation as a new tool is expected to counter old traditions based on a mix of *patronage* and the influence of mentoring (Kirchmeyer 2005) and on Napoleonic legislation. Thus the best candidate in an open competition can be winnowed out. However, the Habilitation does not encourage inbreeding to the same degree. Habilitation holders may will participate anywhere in the country. Beneath these notions the issue of the self-reproduction of communities of scholars is at stake. For this reason the way academic

hypothesis that the list contains not prestigious journals and that this might have brought to false speculations upon the worthiness of the attainment of the title in accordance with this indicator remain, hitherto, without answer.

disciplinary communities, scattered throughout the nation's institutions of higher education, decide to reproduce themselves may affect their own capacity to develop.

3. Descriptive statistics of candidates

The current situation of Italian university personnel is critical. The average age of scholars is rising and the prospect of a budget to cover the needs of academic recruitment is remote. Since 2008, the total number of professors in Italy started to decline as a policy of "turn over" aimed at cutting posts. In 2008 the total number of professors in universities was 62.768; in 2012 already 54.929. On December 31st 2012 the average age was: 58.9 for full professors; 52.9 for associates; 45.4 for research assistants. A decade before, in 2002, the corresponding statistic was: 57.2; 50.9; 43.8. This development stemmed from a progressively postponed admission to the three respective ranks.

The first round in the new habilitation process reflected a massive demand to either to enter Italian academia (associate level) or to accede to the highest level possible (full professors). Tables 1 and 2 which respectively present two areas in bibliometric and two in non-bibliometric disciplines, provide general information about the phenomenon. The list of positions reflected recent reforms. The recruitment of fixed-term research assistants began in 2005 with a second type being established in 2010. The majority of research assistantships are still permanent appointments. Both research assistants and associate professors are split between "confirmed" and "unconfirmed" status. *Grosso modo*, rank positions consist basically of full professors, confirmed associates and (confirmed) research assistants. This latter category is important. An unconfirmed researcher or an unconfirmed associate can through the habilitation skip the steps, respectively, to associate or full professorship promotion, provided their ratings are strong enough. No account is taken of "other" positions. They are few and those few represent posts disappearing from the Italian university as retirement takes its toll. The analysis also excluded other non-employees in university on the grounds they may well be young researchers holding other non-permanent appointments or, alternatively, they were researchers at other institutions.

Table 1 shows that the main candidates for full professorships are currently confirmed associate professors (associate professors with no further detail are a strong minority). In each rank, the ratio of people applying to be 'habilitated' is interesting. The habilitation may fulfil a "cooling out function" (Clark, 1960) amongst those who recognize the lightness of their publication list. However, further information about publications of non-candidates is, unfortunately, unavailable. It is possible, however, to compute the average ages for those awarded the habilitation and those failing it. This information figures in the last two columns of the Tables 1 and 2. For the bibliometic domain in both areas, the average ages of awardees for full professors' rank are younger: 48.7 vs. 50.2 in physics; 45.6 vs. 46.4 in engineering).

Table 1 around here

In Table 2 the situation is very similar. As in Table 1, around half the associate professors were candidates for habilitation to full professorship, while much less are the candidates who are research assistants, both expressed as absolute numbers or percentage over the total population in a rung. As in table 1, those awarded are younger than those denied: 44.1 v. 47.4 in Law; 44.5 vs. 47.9 in Economics.

Table 2 around here

4. Data Analyses: is something changing in career ladders?

The analysis presented here focuses on discussing three models applied to each area. The first model covers three indicators of scientific productivity to determine if selection of candidates is simply a function of their output with the type of their production. As was explained above, in the analysis these indicators are considered as representing the essence of objectivity and meritocracy. Be that as it may scholarly literature, and not just classics like Merton, always has always expressed misgivings about the non-meritocratic aspects and predictability of career advancement in academia (Lent *et al.*, 1994). Being aware of this general assumption suggests however that the paradigm the new institution of habilitation ought to uphold is the principle of "objective measurements of productivity" that traditionally is absent:

people differentially recall, weight, and integrate past performance information in arriving at efficacy appraisals; thus, such appraisals are not likely to be isomorphic with, or mechanically implanted by, past performance indicators (Lent et al. 1994: 87)

In this respect self-efficacy (Lent *et al.* 1994) is very important form of competition if one is to be genuinely and deeply confident of one's success. The Weberian concept of *Beruf* and the "calling" aspect of academic career can serve to illustrate the difference. In countries like Italy where higher education is characterized by low investments in R&D and restrictions of recruitment and promotions, the Habilitation may act as a strong deterrent, encouraging many young scholars to "opt out" of the academic career.

The second model examines age. Is an individual candidate, with the same publications output as his – or her – competitors more likely to advance in his/her career if, for instance, he/she is younger or older. Literature on age and output has a solid history, especially in the United States. Clemente (1973) discussed findings dating back to the 1940s and 1950s which affirmed that early publications could be a good proxy of the individual's career potential. Thus early publications are a pointer to high research outputs across one's whole career. More recently, Bozeman, Dietz, and Gaughan (2001), focusing only on hard sciences and technology-related professions, argued that today post-doctoral students (who in the Italian context would figure as *outsiders*) are not candidates with the best potential for research and development. Career trajectories, even outside academia also see young adults enjoying their best laboratory experiences. Levin and Stephan (1991) reported that scholarly output cannot depend on age. Not only were there marked differences between different scientific domains but, more particularly different decades gave rise to different paces of productivity over a scientist's career span. The pace as outputs build up is not constant. Moreover empirical evidence brought Levin and Stephan to underline the relevance of investments in R&D. Even though the numbers of scientific outputs deemed eligible was limited to a ten year period (statistics from 2003 till 2012 were included), the quantity of publications may be biased by the author's relative youth, and particularly so for younger scholars seeking the Habilitation for associate professor posts[6]. Recent findings report a certain disquiet about the links between age, cohorts, and periodicity that emerged in science productivity (Hall et al. 2005). So as to test gender discrimination and discrimination arising from sharing the same place of work, the second model controls for both gender and for affiliation of candidates with one committee member.

[6] Some Committees displayed information about personal years spent in active research, taking into account starting age (first publication) minus official periods of maternal/paternal leave.

The third model introduces the ordinal variable of position. For each area studied, the position of confirmed associate professors (the closest rank to full professor) is set as "base" to compare it with each all other ranks. With the third model it is thus possible to see whether position is a good predictor of career, performance and age held constant. This leads to some discussions regarding the traditional pattern of rank with the issue of age: with publication features held constant, are younger or older academics within a given rank more likely to be rewarded? The model controls for the number of years elapsed since the last promotion too. Coefficients both positive and significant would imply the respect for the criteria of seniority. Likewise negative coefficients imply a priority laid upon more recently promoted individuals. The former assumption would confer priority on those who have a longer length of service in a given position, while an assumption based on the potential for a Department or a university would place greater weight on a rising candidate who has the same range and quality of publications because that implies he/she commands greater promise and potential. Here is a possible conflict that the third model seeks to clarify by taking into account the number of years elapsed since the individual's last promotion.

3. 1 Analyses and discussion

In bibliometric areas (Table 3a) the models employ the H index as the main predictor to attain habilitation. Less frequently and with less clarity in terms of statistical significance, the number of articles published is relevant. Citations on the other hand bear negative coefficients, though in Physics these are not significant.

In area 2, age is a negative and a strongly significant predictor (models 2). Younger candidates with same publications output were more likely to be awarded the habilitation. In areas 2 and 9 (models 3), current post is relevant. Confirmed associates, compared with permanent research assistants (positions labeled 3 and 4), have more chance of being awarded the habilitation.

In Area 9, age is a significant negative predictor only when the position of candidates is also taken into account. If the three indicators of output are run with age, gender and affiliation, age shows no clear indications. Age becomes relevant as a possible explanation for being awarded the habilitation only when individuals hold the same rankings (model 3). When comparing individuals at same stage in their career and having same standing in terms of publications (both as number of and citations or quality of), the younger has more chance to get the award. In Physics being younger has a positive effect on its own (model 2), which could be coherent with traditional early career patterns in this field.

Only for Area 9 does a shared affiliation of candidates with one of the Committees' members play a role: in these sectors, applying whilst "having a colleague inside" made attaining the Habilitation more probable. In Model 3, the coefficient is higher than in Model 2, which implies that common affiliation played a stronger role in respect both of career ladder and preference for younger candidates.

Table 3a around here

Table 3b on the other hand provides the same models with the unique difference of sort of indicators (articles in top ranked journals, chapters and other articles, books). Interestingly, there is a marked difference between the disciplines of law and economics: for the former, the number of chapters and articles published are more decisive as to who is awarded the habilitation. The

latter sets store on the number of articles in top ranked reviews. The difference may reflect disciplinary cultures, degrees of internationalization and substantial consensus on selecting top ranked journals in Law. However, the common trait is that even in non-bibliometric sectors at least one kind of indicator discerns well the attainments. Yet, both Law and Economics draw on different explanations for obtaining the habilitation. In both, age is a solid predictor: younger candidates, having same indicators of performance (models 2 and 3), are more likely to be successful. This was not so for the two areas covered by bibliometric indicators. Still, the third models tell a story similar to Table 3a: the more advanced the individual is in ladder ranking, the greater the chance of being awarded the Habilitation as the final step in his – or her – career. As in Table3a, candidates who are more likely to be winners are younger in their respective ranks. In effect, within the ladder ranks there is a preference for those having a younger profile.

Succinctly stated, these two findings reveal a system, which tends to favour early careers and good publication records regardless of years of service the individual has notched up in his – or her – current rank (i.e. years since last promotion: "yprom"). Seniority would imply that those with more time spent in the same rank would be more likely to attain the Habilitation. Yet, but all model 3s in the four areas examine show no statistical significance.

Table 3b around here

In principle, the filtering out mechanism the Habilitation established should undermine that informal practice of patronage and triage exercised by influential chair holders over their discretion. Even so social capital and patronage plus the practice of backing marginally qualified candidates cannot in future be ruled out entirely. Much may depend on how bargaining processes themselves evolve. That future competitions will take place locally and at the level of the individual institution, giving rise to even greater latitude and room for maneuvering. Added to this is the drive towards greater institutional autonomy in shaping the academic labour market (Musselin 2005a; Perotti 2002). Bearing these developments in mind, it is no easy task to estimate either the future effectiveness or the impact the Habilitation will have.

5. Conclusions and Discussions About promotion through habilitation

The data show clearly that seniority is no longer the main criterion and rationale for career advancement in Italian universities, though it must equally be admitted that neither data nor enquiry have ever demonstrated how widespread the practice of academic inbreeding was. In any case informal and opaque deals (Nelken 2009) and *scripts* (Dany Louvel Valette 2011) play an important part in promotions. In a more systematic way, Bourdieu (1984: 86-95) investigated in depth the system of power which is intrinsic to social reproduction in academia and therefore to academic careers. In his view, the relations between disciples and masters within hierarchies and communities cannot dispense with a particular form of clientelism, the root principle of which is: "None should take upon himself the responsibility of Master who has not himself sat at the feet of a Master". Yet, the practice of seniority is nevertheless part of a juridical framework that New Public Management and the recent general law both seek to modify root and branch. Rather, it would appear that the principle of seniority is not yet dead, nor is it wholly recognized. In fact, time in current post is a negative predictor for research assistants applying for full professorship when compared with associates, academic output amongst candidates being held equal. Analyzing the age of candidates shows that those most likely to be awarded the Habilitation are individuals who reached their current ranking whilst relatively

young, output being held constant. It would appear that such individuals have the opening to, or the continued pursuit of, rapid advancement in their careers by dint of being habilitated for full professorial appointment.

Such a development upholds the hypothesis that the Habilitation, as a new selective and filtering mechanism, generates change and adaptation without however uprooting current practices entirely. To this extent it may well be that the Italian system of academic careers may move progressively towards a system in which formal ranks are less important for career advancement. Other explanations should also be born in mind. It might well be that younger candidates – even though the H index is strongly time-related, and thus age dependent, (this does not apply to non-bibliometric sectors where straightforward citations are not taken into account) – and candidates in the earlier stages of their career path, were encouraged to publish differently from earlier academic generations. Hence, with increasing differences in output beginning at different times (Dietz Bozeman 2005) why the majority of younger scholars show better productivity, can be explained. On this basis, arguably the habilitation is more likely to deter the less productive who are, at the same time, older. Habilitation in Italy, we would suggest, is engaged in conferring reputation in a way different from before (Harley Muller-Camen Collin 2004). Those less productive, even though senior in status or those currently occupying a rank which confers the right to demand further upward promotion, are winnowed out.

Finally, the Italian system, even though profoundly overhauled by the recent general Law, remains in respect of the academic career ladder – a *regular employee track.* It did not opt to move over to being a *contract track* or a *tenure track* (Enders, 2001). More analyses and data (both in terms of variables, observations over time, and real competition between the winners as well to get real posts) will have to be gathered before any new pattern can be identified and discerned.

To sum up, despite some disciplinary differences, generally one or two indicators out of three clearly act as the main determinant of the decisions to award or not to award eligibility to apply for a full professorship. Hence performance, especially in terms of quality and strategic scientific publications, is the key factor in pushing on and climbing the academic career ladder to the top (full professorship). Furthermore, younger scholars in each position can bypass their older peers, even with the same indicators of productivity. May be their higher potential means more is expected of them. However those in the upper ranks still have some advantage, even though younger candidates – as models 3 show – are preferred to the more senior. This looks to be an interesting development that merits being pursued further.

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Table 1. – Demographic statistics, candidates and average age of those awarded and not awarded habilitations by rank. Bibliometric areas; full professorships ranks

	Physics						Engineering					
	N	%	candidates	ratio	age (W)	age (L)	N	%	candidates	ratio	age (W)	age (L)
1.Researcher fixed-term 10Law	77	3.4	1	1.3	---	38.0	190	3.6	0	0	---	38.0
2. Researcher fixed-term 05Decree	45	2.0	0	0.0	---	---	155	2.9	2	1.3	---	---
3. Researcher not-confirmed	128	5.7	11	8.6	41.4	37.8	322	6.1	11	3.4	41.4	37.8
4. Researcher (confirmed)	737	32.7	119	16.1	45.1	47.7	1603	30.4	122	7.6	45.1	47.7
5. Ass. not-confirmed p.	75	3.3	53	70.7	44.2	45.9	218	4.1	129	59.2	44.2	45.9
6. Ass. confirmed p.	653	29.0	359	55.0	50.8	53.7	1228	23.3	645	52.5	50.8	53.7
7. Ass. Professor	11	0.5	9	81.8	50.8	53.7	47	0.9	28	59.6	43.1	48.0
8. Full professor	471	20.9	0	0.0	---	---	1358	25.8	0	0.0	---	---
Others	56	2.5	1	1.8	48.0	---	148	2.8	2	1.4	48.0	---
Total	2253	100.0	553	24.5%	48.7	50.2	5269	100.0	939	17.8%	45.6	46.4

Source: derived from MIUR data

Table 2. – Demographic statistics, candidates and average ages of those awarded and not awarded habilitation by rank. Non-bibliometric areas; full professorship ranks

	Law						Economics					
	N	%	candidates	ratio	age (W)	age (L)	N	%	candidates	ratio	age (W)	age (L)
1.Researcher fixed-term 10Law	99	2.0	0	0.0	---	---	138	2.9	5	3.6	42.8	50.0
2. Researcher fixed-term 05Decree	102	2.1	0	0.0	---	---	162	3.4	1	0.6	41.0	---
3. Researcher not-confirmed	289	5.9	4	1.4	---	42.8	282	5.9	12	4.3	36.7	36.3
4. Researcher (confirmed)	1659	34.0	70	4.2	38.7	46.2	1432	29.7	103	7.2	39.8	44.3
5. Ass. not-confirmed p.	191	3.9	80	41.9	40.3	43.1	211	4.4	137	64.9	41.7	44.0
6. Ass. confirmed p.	895	18.4	470	52.5	45.1	48.6	1075	22.3	586	54.5	46.3	49.5
7. Ass. Professor	39	0.8	14	35.9	38.2	47.1	29	0.6	14	48.3	41.2	41.3
8. Full professor	1388	28.5	0	0.0	---	---	1351	28.1	0	0.0	---	---
Others	212	4.3	5	2.4	48.0	42.8	135	2.8	1	0.7	41.0	---
Total	4874	100.0	643	13.2	44.1	47.4	4815	100.0	859	17.8	44.5	47.9

Source: derived from MIUR data

Table 3a. Models for attaining the habilitation for full professorships in bibliometric areas

	(1) A2_1	(2) A2_1	(3) A2_1	(1) A9_1	(2) A9_1	(3) A9_1
h_i	0.0365*	0.0299*	0.0326*	0.235***	0.243***	0.273***
	(2.47)	(2.01)	(2.13)	(5.27)	(5.39)	(5.50)
art	0.000209	0.00145	0.00117	0.0111	0.0103	0.0144*
	(0.11)	(0.73)	(0.57)	(1.89)	(1.75)	(2.10)
cit	-0.00129	-0.00184	-0.00139	-0.0140**	-0.0153**	-0.0132*
	(-1.29)	(-1.84)	(-1.33)	(-2.75)	(-2.96)	(-2.27)
aff		0.129	0.0881		0.790***	0.901***
		(0.51)	(0.34)		(3.88)	(4.05)
age		-0.0529***	-0.0884***		-0.00661	-0.0753***
		(-3.60)	(-4.03)		(-0.50)	(-4.19)
sex		0.280	0.232		-0.135	-0.274
		(1.07)	(0.85)		(-0.68)	(-1.27)
1. Fixed-term R.A. 10Law			0			
			(.)			0
2. Fixed-term R.A. 05Decree						(.)
			-2.093**			-3.342***
3. R.A. not-confirmed			(-2.99)			(-4.38)
			-1.345***			-2.870***
4. Researcher assistant (confirmed)			(-4.91)			(-10.13)
			0.334			-0.594*
5. Ass. not-confirmed p.			(0.76)			(-2.16)
			-0.270			-0.694
7. Ass. Professor			(-0.32)			(-1.43)
yprom			0.0120			0.0269
			(0.31)			(0.79)
_cons	0.144	2.550**	4.555***	-1.217***	-0.903	2.414**
	(0.72)	(3.06)	(4.23)	(-5.24)	(-1.26)	(2.79)
N	552	552	551	932	931	927

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Source: derived from MIUR data

Table 3b. Models for attaining the habilitation for full professorships in non-bibliometric areas

	(1) A12_1	(2) A12_1	(3) A12_1	(1) A13_1	(2) A13_1	(3) A13_1
Top_art	0.0160	0.00481	0.0173	0.262***	0.227***	0.236***
	(0.94)	(0.28)	(0.96)	(8.40)	(7.10)	(7.05)
Book	-0.0421	-0.0575	-0.0584	0.0338	0.0309	0.0187
	(-1.57)	(-1.16)	(-1.10)	(0.96)	(0.86)	(0.51)
Chapt	0.0307***	0.0291***	0.0250***	0.0243***	0.0209***	0.0236***
	(4.54)	(4.23)	(3.57)	(4.15)	(3.53)	(3.86)
Aff		0.548	0.612		0.468	0.544*
		(1.49)	(1.57)		(1.84)	(2.09)
Age		-0.0559***	-0.0798***		-0.0442***	-0.0452**
		(-4.30)	(-4.83)		(-3.56)	(-2.93)
Sex		0.159	0.220		0.0796	0.000713
		(0.89)	(1.18)		(0.50)	(0.00)
						-0.685
1. Fixed-term R.A. 10Law						(-0.55)
						-2.087
2. Fixed-term R.A. 05Decree						(-1.31)
			0			-1.544*
3. R.A. not-confirmed			(.)			(-2.38)
			-2.187***			-1.305***
4. Researcher assistant (confirmed)			(-5.70)			(-4.85)
			-0.524			0.136
5. Ass. not-confirmed p.			(-1.81)			(0.51)
			-0.900			-0.0767
7. Ass. Professor			(-1.44)			(-0.10)
yprom			0.0142			-0.0698
			(0.32)			(-1.92)
_cons	-0.844***	1.603*	2.866***	-0.991***	1.053	1.622*
	(-5.26)	(2.29)	(3.61)	(-5.89)	(1.58)	(2.12)
N	637	637	633	858	858	858

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Source: derived from MIUR data